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COLLEGE SUCCESS OF FORMER STUDENTS OF VOCATIONAL AGRICULTURE.

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IN THE 32 INVESTIGATIONS OF THE COLLEGE SUCCESS OF FORMER VOCATIONAL AGRICULTURE STUDENTS REPORTED IN "SUMMARIES OF STUDIES IN AGRICULTURAL EDUCATION" SINCE 1929, THE MOST COMMON CRITERIA FOR MEASURING ACHIEVEMENT OF VOCATIONAL AGRICULTURE GRADUATES WERE GRADES IN ALL COLLEGE WORK AFTER 4 YEARS, GRADES IN ALL COLLEGE WORK AFTER SPECIFIED PERIODS, GRADES IN VARIOUS GROUPS OF COURSES, AND GRADES IN SPECIALLY SELECTED INDIVIDUAL COURSES. THE 32 STUDIES REPORTED ANALYSES OF THE RECORDS OF MORE THAN 17,800 STUDENTS IN 20 STATES. ALTHOUGH THE CRITERIA FOR COLLEGE SUCCESS VARIED AMONG THE STUDIES, 53.8 PERCENT OF THE TOTAL NUMBER OF FINDINGS SHOWED THAT THE VOCATIONAL AGRICULTURE GROUP DID BETTER THAN THE NONVOCATIONAL GROUP, 36.6 PERCENT SHOWED THAT THEY DID AS WELL, AND ONLY 9.6 PERCENT SHOWED THAT THEY DID POORER THAN THE NONVOCATIONAL GROUP. AS A GROUP, VOCATIONAL STUDENTS APPEARED TO DO EITHER AS WELL AS OR BETTER THAN DID NONVOCATIONAL STUDENTS IN AGRICULTURAL COLLEGES. VOCATIONAL AGRICULTURE APPEARED TO BE EQUAL TO OTHER HIGH SCHOOL PROGRAMS AS PREPARATION FOR COLLEGE WITH LITTLE BASIS FOR DISCRIMINATION AGAINST VOCATIONAL AGRICULTURE. IT WAS CONCLUDED THAT UNLESS SPECIAL CIRCUMSTANCES EXIST, A STUDENT WHO WANTS TO ENROLL IN AN AGRICULTURAL COLLEGE CAN BE CONFIDENTLY ADVISED TO TAKE VOCATIONAL AGRICULTURE WHILE IN HIGH SCHOOL. THE REVIEWED STUDIES AND THEIR SOURCES ARE LISTED. THIS ARTICLE WAS PUBLISHED IN "AGRICULTURAL EDUCATION MAGAZINE," FEBRUARY 1960. (WB)

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**What do studies show? - - -**

# College Success of Former Students of Vocational Agriculture

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Should a boy who wants to go to a college of agriculture study vocational agriculture in high school?

One approach to answering the above question is to look into the research which has been done on the subject of how well former students of vocational agriculture have done in college. With this thought in mind, the author reviewed the thirteen editions of *Summaries of Studies in Agricultural Education*, U. S. Department of Health, Education, and Welfare, Office of Education. The reader will recall that these publications contain brief summaries of all the studies done in the field of agricultural education in the United States. Most of the investigations were performed at land-grant institutions by advanced degree candidates, but some were done by teacher trainers and state supervisors. Thirty-two studies relating to this subject were found.

Generally speaking, the researchers attempted to compare the success of former students of vocational agriculture with those who had not taken this course in high school. In the studies reviewed, what constituted a former student of vocational agriculture ranged from a person with five to seven units of vocational agriculture to anyone with at least one unit of vocational agriculture. This variability also extended to the various criteria used for measuring college success. Among them were scholastic achievement, election to honor societies, the college attrition rate, the number who entered agricultural occupations, and participation in extra-curricular activities.

Furthermore, for the purpose of this report, only results pertaining to scholastic achievement will be cited. Former students of vocational agriculture will be referred to as the vocational group while their counterparts will be referred to as the non-vocational or control group.

The three earliest investigations on this subject reported in *Summaries of Studies in Agricultural Education* were completed in 1929. Maddox and Dickinson (21), who studied the records of 230 University of Missouri College of Agriculture students, found that the average college grades for the vocational and nonvocational groups were *2.0* and *1.8* respectively. They also found, upon stratifying their data, that the vocational group *excelled* in the three groups of subjects studied, namely, technical agriculture, sciences, and academic subjects. It should be noted that the aver-

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age high school grade for the vocational group was 2.51 compared with 2.25 for the nonvocational group. Peeler (27) of North Carolina found that the vocational boys in his survey were *superior* in animal husbandry and chemistry, *slightly superior* in botany, English, social sciences, education, zoology, and other agricultural subjects, and equal in horticulture, poultry, and farm crops. In the third 1929 report, Farmer (13) studied the records of 7,765 freshman students at three Virginia colleges and noted *no significant difference* between vocational students and other students in scholastic standing in history, mathematics, art and language, but that the vocational students *performed better* than others in agricultural and science subjects.

In Missouri, Singleton (29) studied 426 students in 1931 and reported that the vocational group earned an average of 2.25 in courses in agriculture compared with 2.11 for the nonvocational group. Fay's (14) 1932 Wisconsin report on 526 freshmen showed that in terms of first-year grade point ratios, the vocational agriculture group *did better* than two check groups, those who took vocational subjects other than agriculture in high school and those who took no vocational work at all. Bradford (4), pairing 500 Nebraska students according to their high school grades and intelligence quotients, found that the vocational group had an average grade in all subjects of 78.1 as contrasted with 76.8 for the nonvocational graduates. The former group *did better* than the latter group in agricultural subjects but *approximately the same* in English, mathematics, economics and natural science. In a Louisiana study in 1933, Hester (19), in a sample of 224 boys, found that former students of vocational agriculture excelled in all subjects in college except engineering drawing. Moss (24), in a 1947 Texas study involving 100 former students of vocational agriculture and 100 control students, said that there was *no significant difference* between the two groups when the criterion was their total grade point average for all college work. However, the vocational group did *slightly better* than the nonvocational group in agricultural subjects. In North Carolina, 219 students were studied by Santorum (28) in 1950. He found that the vocational group did *slightly better* in courses related to vocational agriculture, like agricultural engineering and field crops, than the control group. However, they did *just as well* in mathematics, physics, chemistry, science, history, farm shop, livestock, and crops courses, and *poorer* in English. Using first-quarter grade-point average as the criterion, Bunten (7) found in 1951 in Colorado that 106 students who took vocational agriculture in high school were prepared *equally as well* for college agriculture as 284 students who took the more traditional college preparatory courses. Wiggins (32) reported in a 1953 Pennsylvania study that *no significant differences* in college honor-point averages were found among 93 students divided into three groups: those with four years of vocational agriculture, those with one to three years, and those with none. Also in 1953, Bell (1) showed in Oklahoma, after studying the records of 417 students, that those who had vocational agriculture in high school *did consistently better* work in those college subjects directly related to agriculture. After his investigation in North Carolina in 1954 involving 169 students, Watson (31) could not say that non-vocational students *do any better* in agriculture, mathematics, or science than do vocational students. In South Carolina, Hall (17), in 1955, found *no significant difference* in college grades between the two groups.

In one of the largest studies reported, involving 1016 students, Burch (6), in 1957 found that students with one or more units of vocational agriculture consistently *earned better grades* than did students without vocational agriculture in the following basic agriculture courses at the University of Missouri: Farm Shop 10, Animal Husbandry 1, Dairy Husbandry 1, Field Crops 1, and Poultry Husbandry 1. Furthermore, the former group also *did somewhat better* in Zoology 1. There was very little contrast between the two groups in their achievements in Botany 1. In another 1957 report, Circle (9) of Kansas showed that the vocational groups (5-7 units of vocational agriculture) had a *significantly higher mean* grade point upon graduation than the control group. A population of 185 graduates was used in Circle's investigation.

In a University of California study at Davis, Thompson (30), in 1958, working with 75 vocational students and a like number of nonvocational students, showed that there was *no demonstrable difference* in grade-point averages between students who had three or more years of vocational agriculture in high school and those who had not taken agriculture in high school. Similarly, studying the records of 260 vocational and 364 nonvocational students at Oregon State College, Pedersen (26), in 1958, found *no difference* in scholastic achievement at the end of the freshman year between the two groups. On the other hand, Cunningham's (11) research in 1958 in Ohio on 429 students showed that the vocational agriculture group had a *higher* scholastic record in technical agriculture, mathematics, and total program than did the control group, but did *poorer* in English. From the University of Minnesota, Hanson (18) reported in 1958 that when he divided his 720 students into eight high school course-pattern subgroups and analyzed their scholastic achievements, he could find *no significant differences* in (1) first-quarter honor-point ratios; (2) first-year honor-point ratios; and (3) first-year honor-point ratios of agriculture courses. However, when the criteria of honor-point ratios in basic science and mathematics were used, the vocational sub-group did *poorer* than those which had a high level of high school course work in science and mathematics.

In discussing the scholastic achievements of the vocational versus the nonvocational group, the reader might be interested in knowing that some studies specifically report upon the intelligence level or the scholastic aptitude level of the groups. Among them are the four to be reported below. According to the summary of McCalley's (23) research in Iowa in 1930 involving 287 vocational boys, although the intelligence rating of the vocational graduates was slightly lower than others in college, the vocational group earned grades in all subjects *approximately at the average* for all college students, *had higher grades* in the first year of college, and made *slightly higher grades* in mathematics and in three introductory animal husbandry courses. In another case where the vocational group had a lower intelligence rating, Clark (10), also in 1930, worked with the records of 286 students in New York and found that the vocational group who had had at least six units of vocational agriculture had average grades in all college subjects *as high as* those of the nonvocational group. He also discovered that although the difference in grades was not great, the vocational group did *better* in agri-

cultural and science courses but *poorer* in English, economics and mathematics. In Merritt's (22) survey of 272 students in New York in 1938, he found the vocational group to be lower in scholastic aptitude, ranking at the 6.7 decile in comparison with the 8.3 for the control group. Nevertheless, in spite of the lower aptitude, the scholastic achievement of the vocational group was *generally the same* as the other group. In an investigation similar to Merritt's, Brooks (5), in 1954, using 170 students, reported that his vocational group had an average ACE percentile rank of 31.16 while the control group averaged 49.60. This wide difference notwithstanding, the vocational group had the respectable grade point average in all courses taken of *2.61* as compared with *2.64* for the control group. Brooks seems to feel some justification, when the intelligence level of the students was considered, in saying that the vocational agriculture curriculum was more satisfactory than others in Maryland high schools for students entering the College of Agriculture curricula at the University of Maryland.

Perhaps the institution that has done the most research in the area of college achievements of former students of vocational agriculture is Iowa State College. In addition to McCalley's study already reviewed, seven others were completed at that institution between 1947 and 1950. Gamble (16), Drake (12), Carter (8), and Bicknell (3) used the commendable analysis of co-variance technique, controlling on ACE scores and English marks. Gamble found *no significant differences* between the two groups (N = 164) in terms of the final mark in the beginning poultry husbandry course. Drake *did likewise* in the case of the introductory course in dairy industry (N = 256). On the other hand, Carter (N = 224) showed that the vocational group *significantly excelled* the control group by one-third of a letter mark in first year botany. Similarly, Bicknell, working with 997 students, found that the vocational group *did better* in honor-point rates earned in first-quarter agriculture courses than did the three other groups in the study. From his findings, one may also conclude that the vocational group *did poorer* in chemistry than one or more of the other groups.

In 1947, Bicknell (2) studied the records of 337 freshmen. Based on their ACE scores and high school grades, the vocational group *did better* than predicted while the control group *did poorer* than expected in their first-quarter grade point average. Using a similar prediction technique, O'Brien (25) found that in his study of 184 freshmen, based on their ACE scores and their first-quarter English marks, the vocational group *did better* than expected in the beginning farm mechanics course. In contrast, the control group *did poorer* than expected. An analysis of co-variance showed a difference favoring the vocational group which was significant at a level higher than five per cent.

The remaining Iowa study, done by Fulton (15), in 1956, involved 237 students. With the final mark in the introductory farm mechanics course as a criterion, it was found that the vocational group *did significantly better* than did the nonvocational group.

Practically all the studies reviewed compared vocational and nonvocational boys in their achievements in a *college of agriculture*. In a very interesting variation, Long (20) in 1958, studied the scholastic achievement in the *freshman engineering curriculum* at Oregon State College of 90 students who had had two or more years of vocational agriculture. He found that the mean grade-point average for the vocational group in freshman engineering was *2.57* as compared with *2.36* for the control group, with 4.0 being the perfect grade-point average. This shows that the vocational group *did slightly better* than other freshmen students in engineering at Oregon State College.

## Summary

Since 1929, a total of thirty-two investigations on the subject of how well former students of vocational agriculture have done in college have been reported in *Summaries of Studies in Agricultural Education*. The most common criteria for measuring achievement were grades in all college work after four years, grades in all college work after specified periods, grades in various *groups* of courses, and grades in specially selected *individual* courses. The records of more than *17,800* students in *twenty* states were analyzed in the thirty-two studies reviewed.

Table I shows a summary of the major findings revealed in the review. It can be noted that 53.8 per cent of the total number of findings showed that the vocational group did better than the nonvocational group, 36.6 per cent showed they did as well, and only 9.6 per cent showed that the vocational group did poorer than the nonvocational one. These results should be interpreted with the realization that the criteria for college success varied from study to study, as mentioned earlier in this article.

**TABLE I**

**Summary of Major Findings of Thirty-two Studies, 1929-1958 on the College Success of Former Students of Vocational Agriculture**

| *Classification* | *Major Findings* | |
|---|---|---|
| | *Number* | *Per Cent* |
| Vocational group did better than nonvocational group | 50 | 53.8 |
| Vocational group did as well as nonvocational group | 34 | 36.6 |
| Vocational group did poorer than nonvocational group | 9 | 9.6 |
| TOTAL | 93 | 100.0 |

## Conclusion

The question with which this article began cannot be categorically answered in a yes or no fashion because of the various individual differences one would find among students. Nevertheless, the weight of the evidence presented above does seem to indicate that vocational students, taken as a group, seem generally to do either as well as or better than do nonvocational students in colleges of agriculture. Vocational agriculture seems to be equal to other high school programs as preparation for college. Certainly, there appears little basis for discriminating against vocational agriculture, and only poor grounds exist for counselling out of vocational agriculture those boys who aspire for professional careers in agriculture.

Furthermore, people enter the kind of college in which they are interested. Therefore, during their high school career, this interest should be developed, nurtured, maintained, and enhanced. The daily exposure to work in vocational agriculture can keep boys interested in things agricultural with the hopeful result that the college-bound student chooses to enroll in a college of agriculture. Surely, no other high school course is better fitted for this purpose than vocational agriculture.

Therefore, because of what the above studies show and because of his belief that the vocational agriculture course is the best one in high school for stimulating a boy's interest in agriculture, the author concludes that unless special circumstances mitigate against doing so, one can, with a great deal of confidence, advise a boy who wants to go to an agricul-

ural college to take vocational agriculture while in high school.

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Note: The number in parenthesis following each citation is the number given the study in the U.S. Office of Education "Summaries of Studies in Agricultural Education" Series, Bulletins 180, Supplement 1 to Bulletin 180, 237, 242, 246, 248, 251, 253, 256, 263, 265, 272, and 275.


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